

POSTER PRESENTATION

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Effects of ingesting a pre-workout supplement with and without synephrine on cognitive function, perceptions of readiness to perform, and exercise performance

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Background

A number of nutritional strategies have been developed to optimize nutrient delivery prior to exercise. As a result, a number of pre-workout supplements have been developed to increase energy availability, promote vasodilation, and/or positively affect exercise capacity. The purpose of this study was to examine the acute effects of ingesting a pre-workout dietary supplement with and without synephrine on cognitive function, perceptions of readiness to perform, and exercise performance.

Methods

In a double-blind, crossover, randomized and placebo-controlled manner; 25 apparently healthy and recreationally active men and women (21.76 ± 3.00 yr, $15.24 \pm 5.26\%$ fat, 25.09 ± 3.03 kg/m²) volunteered to participate in this study and performed a Stroup-Color cognitive function test (CFT) and rated perceptions of readiness to perform on a visual analogue scale (RTP-VAS). Participants then ingested in a randomized and counterbalanced manner a dextrose flavored placebo (P); a pre-workout supplement (PWS) containing 3.0 g beta alanine, 2 g creatine nitrate, 2 g arginine AKG, 300 mg of N-acetyl tyrosine, 270 mg caffeine, 15 mg of Mucuna pruriens; or, the PWS with 20 mg of synephrine (PWS+S). Approximately 30 minutes following ingestion of the supplements, participants performed a second CFT, completed a RTP-VAS, and then performed 3 sets of 10 repetitions at 70% of 1 repetition maximum (1RM) on the bench press and leg press

with 2 minutes recovery between sets and 5 minutes recovery from exercise modes. Participants completed as many repetitions as possible during the final set. Following a 5-minute recovery, subjects also performed a 30-sec Wingate Anaerobic Capacity test on a cycle ergometer for determination of peak power (PP), mean power (MP), and total work (TW). Lastly, subjects performed a third CFT and RTP-VAS test. Participants repeated the experiment after a one week washout period with alternate supplements provided in a randomized and counterbalanced manner. Data were analyzed by repeated measure MANOVA or ANOVA and are presented as means \pm SEM from baseline. Consent to publish the results was obtained from all participants.

Results

Repeated measures MANOVA analysis revealed significant interactions among supplementation groups in ratings of "I am optimistic about my future performance" (P: 3.70 ± 0.95 ; PWS: 4.05 ± 0.73 ; PWS+S: 4.21 ± 0.63 ; $p < 0.01$), "I feel vigorous and energetic" (P: 3.35 ± 0.91 ; PWS: 3.77 ± 0.79 ; PWS+S: 3.89 ± 0.74 ; $p = 0.01$), and "I have little muscle soreness" (P: 3.42 ± 1.00 ; PWS: 3.81 ± 1.36 ; PWS+S: 3.27 ± 1.29 , $p = 0.04$) 30 minutes after ingestion. MANOVA revealed an overall Wilks' Lambda time ($p < 0.001$) and time \times group interaction ($p = 0.003$) effect on the CFT results. Delta analysis revealed that mean changes in word (P: 0.64 ± 1.1 ; PWS: 3.57 ± 1.1 ; PWS+S: 7.40 ± 1.1 ; $p < 0.001$), color (P: 1.41 ± 0.7 ; PWS: 4.01 ± 0.7 ; PWS+S: 5.08 ± 0.7 ; $p = 0.002$), and word-color (P: 1.8 ± 1.0 ; PWS: 3.28 ± 1.0 ; PWS+S: 5.41 ± 1.0 ; $p = 0.03$) were greater in the PWS and PWS+S groups than P with

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PWS+S word responses greater than PWS. There were no significant differences among groups in Wingate PP (P: $1,579 \pm 510$; PWS: $1,502 \pm 561$; PWS+S: $1,491 \pm 516$ W; $p=0.46$), MP (P: 602 ± 132 ; PWS: 596 ± 145 ; PWS+S: 583 ± 188 W; $p=0.60$), or TW (P: $17,663 \pm 4,605$; PWS: $17,850 \pm 4,341$; PWS+S: $18,203 \pm 4,658$ J; $p=0.49$). MANOVA revealed significant Wilks' Lambda time and time x group ($p<0.001$) effects in bench press and leg press lifting volume in the final set of exercise. MANOVA univariate analysis revealed no significant Greenhouse-Geisser differences among groups in third set bench press lifting volume (P: $4,749 \pm 1,606$; PWS: $4,889 \pm 1,614$; PWS+S: $4,870 \pm 2,000$ lbs; $p<0.51$). Leg press lifting volume differed among groups (P: $27,607 \pm 9,608$; PWS: $28,905 \pm 9,859$; PWS+S: $19,342 \pm 4,855$ lbs; $p<0.51$) but PWS supplementation did not provide greater benefit than P.

Conclusion

Ingesting a PWS and PWS with 20 mg of synephrine 30-minutes prior to exercise enhanced perceptions of readiness to perform and cognitive function with no significant effects on anaerobic capacity or isotonic lifting volume.

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